

Recovery Plan Action Status

Plan Name: Fishes of the Rio Yaqui (4 spp.)

Plan Status: Final

Plan Date: 29-Mar-95

Lead Agency: USFWS

Lead Office: San Bernardino National Wildlife Refuge

(364-2104)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	1	1.1	Pursue agreements and development of management plans for long-term survival of fishes of concern in Mexico	Not Started			Arizona Department of Game and Fish, Centro Ecologico de Sonora, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	1.2	Develop and implement cooperative management plans	Not Started			Arizona Department of Game and Fish, Centro Ecologico de Sonora, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	3	2.1	Determine aquifer recharge zone, capacities and configuration, and characteristics of sub-surface flow	Complete	FY 1995 - FY 1999	FY 2000 - FY 2004	Arizona Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Contract	Earman et al. 2003. "An investigation of the properties of the San Bernardino groundwater basin, Arizona and Sonora, Mexico."
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	1	2.2	Protect watershed and aquifer	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Acquisition: General	Internal Administrative	Cooperation with adjacent landowners in both Arizona and Sonora. Aquifer monitoring on both public and private lands in the U.S. and Mexico

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	2.3	Determine amounts of water required to maintain listed species at San Bernardino/Leslie Canyon NWR	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	3	2.4	Revise and continue implementation of Refuge Master Plan	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Management: Planning	Contract	USFWS, 1995. "San Bernardino and Leslie Canyon NWRs Comprehensive Management Plan 1995 -2015." This plan is currently being updated as the refuge began work on its Comprehensive Conservation Plan in 2009.
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	2.4.1	Develop water-use plan for San Bernardino/Leslie Canyon NWR	Not Started			USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	3	2.4.2	Develop management plan for each species of concern	Partially Complete	FY 1995 - FY 1999		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	2.4.3	Develop and implement genetic monitoring plans and schedules for each species	Ongoing Current	FY 2000 - FY 2004		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Research: Genetics	Internal Technical Assistance	Genetic monitoring schedule set up every 5 years after baseline. Baseline never completed. A grant was secured by San Bernardino NWR and paid to Dexter National Fish Hatchery in the amount of \$7,500 to conduct genetic analysis on Ictalurus pricei. Unofficial report shows pure yaqui catfish (January 2010)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	2.5	Develop or enhance new and existing habitats; monitor success of habitat management	Ongoing Current	FY 1995 - FY 1999		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Management: Habitat Maintenance and Manipulation, Management: Identify/Protect Foraging, Breeding and Mig Habitats, Management: Land Use, Management: Population Monitoring	Internal Field Assistance	<p>4 Gabions have been built up and 2 new gabions put in place. New wetland created (2011).</p> <p>A fish passage project was completed in January of 2010 for Black Draw at the crossing near Twin Pond. This will allow for the safe movement of fish up and down Black Draw during periods when Black Draw flows, while allowing vehicles to pass through without stirring up sediment or harming fish.</p> <p>A 2 year study was completed on the most recent Hay Hollow Pond to measure for vegetation succession and fish propagation. Report available at the Refuge Headquarters.</p> <p>Annual October monitoring has shown that populations have remained stable with the implementation of habitat improvements. Cattails removed and or thinned from all wetland impoundments. Trees removed from margins on several impoundments. Pull planting in Hay Hollow wash.</p>

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	1	2.6	Eradicate and secure against reinvasion of new introductions of non-indigenous species	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Management: Predator and Competitor Control	Internal Field Assistance	Continued removal of invasive predator (<i>Lithobates catesbeiana</i>) at several ponds
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	2	3.1	Examine and document life histories	Not Started			Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	3.2	Determine impacts of intra- and interspecific interactions in habitats occupied by combinations of species	Not Started			Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	3.3	Determine habitat requirements and habitat utilization	Partially Complete	FY 2007		Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Internal Field Assistance	Hay Hollow Ponds Study (see action 2.5)
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	1	3.4	Determine and delineate genetic composition of existing populations	Not Started			Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Research: Genetics	Internal Technical Assistance	See 2.4.3 catfish DNA analysis

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	2	3.5	Monitor health of fish populations and occupied habitats	Ongoing Current	FY 1995 - FY 1999		Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Research: Population Surveys	Internal Field Assistance	<p>Estimated costs for this are \$9000 annually. The numbers for estimated costs do not reflect this or show that this is an annual population survey and has been ongoing since the approval of the recovery plan in 1995.</p> <p>Included in this annual monitoring is HCP monitoring for the El Coronado Ranch at Turkey Creek in the Chiricahua Mountains and supplemental monitoring of the Douglas High School Pond, 99 Bar Ranch, and the Bar Boot Ranch.</p> <p>For annual monitoring on San Bernadino NWR and Leslie Canyon NWR in 2010 Proportion of Habitat Occupied (PHO) for Gila purpurea was .51291 for all impoundments, up from .50858 in 2008, and .75246 for Poeciliopsis sonoriensis, down from .88925.</p> <p>Ictalurus pricei were captured all three of the three known impoundments in for the first time since 2004; House Pond, at the Slaughter Ranch; Twin Pond on SBNWR; and Big Tank at El Coronado Ranch.</p> <p>In addition to the</p>

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
										<p>annual monitoring the refuge also monitors for infestation rates of Asian tapeworm in <i>G. purpurea</i>. Rates from current monitoring show an 70% rate of occurrence in sampled fish and a 100% rate of occurrence in wetlands surveyed. Even with these rates of occurrence it is believed that Asian tapeworm is having very little, if any effect on survivability of <i>G. purpurea</i>, based on data from annual monitoring.</p> <p><i>Cyprinella formosa</i> are now found in four impoundments on SBNWR and monitoring showed breeding had taken place in two of the four impoundments.</p> <p>Monitoring at the Bar Boot Ranch has not occurred this year due to salvage efforts from the Chiricahua Mountains in response to the Horseshoe 2 Fire. 1200 <i>G. purpurea</i> were relocated to the ranch from El Coronado. There were no <i>P. sonoriensis</i> observed.</p> <p>A report on the monitoring of El Coronado Ranch is available from the Fish and Wildlife Conservation Office in Pinetop.</p> <p>No report has been</p>

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
										obtained for Mexican populations.
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	1	4.1	Maintain levels and quality of subsurface waters	Ongoing Current	Prior to FY 1995		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Management: Habitat Maintenance and Manipulation	Internal Field Assistance	Several monitoring wells, on San Bernardino NWR and in the Leslie Canyon Watershed, are monitored monthly to maintain ground water levels necessary for fish survival. Aquifer water chemistry testing done quarterly on refuge and adjacent private land.
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	2	4.1.1	Apply proper or enhanced land-use practices	Not Started			USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	2	4.1.2	Exclude development such as mining or irrigated agriculture	Ongoing Current			U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Acquisition: Easement, Acquisition: Management Agreement, Management: Land Use	Internal Field Assistance	Several easements have been acquired within the Leslie Canyon Watershed to protect upstream habitat and to ensure adequate water for the Leslie Canyon NWR. In addition several HCPs and SHAs have been inacted to provide additional habitat for these species. (El Coronado HCP, Malpais Borderlands Group HCP, and Leslie Creek Watershed SHA)
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	1	4.1.3	Forge agreements to assure aquifer water quality	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	1	4.2	Work with water users and appropriate agencies and individuals to prevent overuse of water from essential aquifers	Ongoing Current			U.S. Fish and Wildlife Service, Ecological Services Division, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Internal Field Assistance	
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	2	4.4	Acquire and protect or protect through conservation agreements and habitat management plans the essential waters and habitats needed for long-term survival of fishes of concern	Partially Complete	FY 1995 - FY 1999		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Internal Administrative, Internal Field Assistance	2001 USFWS Conservation Easement on 11,585-acre 99-Bar Ranch. 2005 USFWS Conservation Easement on increment of 13,713-acre Bar-Boot Ranch. In 2009 1,757.8 acres of the 13,713 acre Bar-Boot Ranch put into USFWS Conservation Easement. Arizona Fish and Wildlife Conservation Office with the assistance of the refuge is developing a Rio Yaqui Fish Management Plan.
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	5.1	Identify areas for possible reintroductions	Ongoing Current	FY 2006		Arizona Department of Game and Fish, U.S. Geological Survey, New Mexico Department of Game and Fish, Bureau Land Management, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Internal Field Assistance	Several sites have been identified for the reintroduction <i>Poeciliopsis sonoriensis</i> , <i>Gila purpurea</i> , and <i>Cyprinella formosa</i> into upstream habitats of Leslie Canyon NWR

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	5.2.1	Develop breeding protocol	Partially Complete	FY 2005		U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	Protocol developed by UofA for Yaqui chub and Yaqui topminnow. Not yet refined for Yaqui catfish or Yaqui beautiful shiner.
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	5.2.2	Determine fish size, time of year and stocking densities required to ensure survival	Ongoing Current	FY 2007		U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Internal Field Assistance	Hay Hollow Study has been completed. Final report is available at the Refuge Headquarters.
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	5.2.3	Stock and monitor success of reintroductions	Partially Complete	FY 1995 - FY 1999		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Internal Field Assistance	See above
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	5.3	Reintroduce, reestablish and monitor populations of other species of concern	Partially Complete	FY 2000 - FY 2004		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Internal Field Assistance	Malcom et al. 2003. "San Bernardino springsnail population ecology and habitat Needs." AGFD Heritage Grant I02004. Chiricahua leopard frog monitoring in Leslie Canyon conducted three times a year starting in 2009. Yellow-billed cuckoo monitoring taking place on San Bernardino NWR Jun-Jul. Annual monitoring of Huachuca water umbel on San Bernardino and Leslie Canyon NWR.

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	2	5.4	Work with public agencies and private landowners to manage existing and reintroduced populations of fishes of concern	Partially Complete	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	<p>Safe Harbor Agreement for BarBoot and 99-Bar Ranch populations completed, with stocking of <i>Poeciliopsis sonoriensis</i>, <i>Gila purpurea</i>, and <i>Cyprinella formosa sonoriensis</i> taking place.</p> <p>HCP monitoring on El Coronado Ranch continuing with cooperation from AZGFD, AZFWCO, and AZES.</p> <p>Douglas High School has a pond that was surveyed starting in 2008 and has been surveyed annually during the October Fish monitoring.</p> <p>Salvaged yaqui chub from El Coronado Ranch in 2011 and relocated to Bar Boot Ranch and some are also being held at ASDM.</p>
Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>)	3	6.1	Develop comprehensive programs of information and education	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program	Work type not yet selected	Labor type not yet selected	

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	3	6.2	Insure broad dissemination of information in both English and Spanish	Partially Complete	FY 2006	FY 2000 - FY 2004	Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	Bilingual educational signs from Wilderness Graphics installed at five locations in Arizona and Sonora.
Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa)	3	6.3	Establish and maintain archives of published and unpublished materials relevant to aquatic organisms and aquatic habitats of concern in permanent depositories	Ongoing Current	FY 1995 - FY 1999		Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	